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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/679,668	10/05/2000	Gary Mark Crosbie	200-1136	7069

22844 7590 07/15/2003

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EXAMINER

MACK, COREY D

ART UNIT PAPER NUMBER

2855

DATE MAILED: 07/15/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/679,668

Applicant(s)

CROSBIE ET AL.

Examiner

Corey D. Mack

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 22-28 and 33-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-28 and 33-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 22-28 and 33-41, drawn to a gas flow sensor, classified in class 73, subclass 204.26.
  - II. Claims 29-32 and 42-46, drawn to a method for fabricating a gas flow sensor, classified in class 29, subclass 592.1.
2. The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions are unrelated as they cover different subject, i.e. an apparatus for measuring gas flow and a method (process) for fabricating (making) a gas flow sensor.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.
5. During a telephone conversation with Diana D. Brehob on 13 June 2003 a provisional election was made without traverse to prosecute the invention of Group I, claims 22-28 and 33-41. Affirmation of this election must be made by applicant in replying to this Office action.

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Claims 29-32 and 42-46 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

6. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

***Claim Rejections - 35 USC § 112***

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 22-28 and 33-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Specifically, the specification is silent as to the necessity/relevance of the temperature coefficient of resistance being between 2500 and 4500 ppm/degree C as claimed. Therefore, this element has not been enabled.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 22, 24-28, 32, 33, 36, 39 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa, et al. (US 6,134,960) in view of Manginell, et al. (US 6,527,835).

A. With respect to Claims 22 and 33, Yamakawa discloses a gas flow sensor, comprising: a reference resistor element 6a, 6b formed on a first electrically insulating (silicon) substrate 1 and is disposed in a gas flow without heating; a flow-sensing resistor element 4, 5 formed on the electrically insulating substrate, wherein the flow-sensing resistor is heated; and, an electrical circuit 23 in electrical communication with the reference resistor element and the flow-sensing resistor element. Yamakawa also teaches that it was known to form resistor elements of an oxide electrically resistive material (column 1, lines 35-38). Yamakawa does not disclose a temperature coefficient of resistance between 2500 and 4500 ppm/degree C or resistor elements formed on separate substrates. Manginell discloses a thermal flow sensor comprising a flow-sensing resistive element having a temperature coefficient of resistance between 2500 and 4500 ppm/degree C in order to increase sensitivity of the flow measurement (column 4, lines 44-62). Further, it would have been within the knowledge of one of ordinary skill in the art to form the resistive elements on *separate* substrates placed upstream and downstream of each other. (See MPEP § 2144.04). Therefore, at the time the invention was made, it would have been within the knowledge of one of ordinary skill in the art to include in Yamakawa resistive elements having a

coefficient of resistance between 2500 and 4500 ppm/degree C formed on separate substrates in order to sensitively measure flow.

- B. With respect to Claim 24, Yamakawa discloses a temperature of the reference resistor 4 is substantially similar to a temperature of a gas flow flowing past the resistor (column 10, lines 18-37).
- C. With respect to Claim 25, Yamakawa discloses a predetermined temperature differential is maintained between the flow-sensing resistor and the reference resistor (column 10, lines 18-26).
- D. With respect to Claim 26, Yamakawa discloses that the gas is air (column 8, lines 59-64).
- E. With respect to Claims 27 and 33, Yamakawa discloses an electrical circuit for determining a resistance of the reference resistor and a resistance of the flow-sensing resistor wherein a mass flow rate of the gas flow is a function of the resistances (column 9, line 54 – column 10, line 37).
- F. With respect to Claims 28 and 32, Yamakawa discloses an electrical circuit capable of maintaining a target temperature differential between the reference resistor element and the flow-sensing resistor element by controlling an electrical current flow to the flow-sensing resistor element (column 10, lines 11-37).
- G. With respect to Claim 36, Yamakawa discloses that the reference resistor has an electrical resistance at least 10 times the electrical resistance of the flow-sensing resistor (column 1, lines 47-50).

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H. With respect to Claims 39 and 40, Yamakawa discloses a serpentine reference resistor element with having vertical and horizontal segments with an aspect ratio of length/width being at least 2 (See Fig. 1A).

11. Claims 23, 34, 35, 37, 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamakawa, et al. (US 6,134,960) in view of Manginell, et al. (US 6,527,835) as applied to claims 22, 24-28, 32, 33, 36, 39 and 40 above, and further in view of Ellis, et al. (US 6,180,164).

A. With respect to Claims 23 and 34, Yamakawa, as modified by Manginell, discloses the claimed invention, except they do not disclose the oxide electrically resistive material comprises a ruthenium-containing oxide in a glassy matrix. Ellis discloses an oxide electrically resistive material comprising a ruthenium-containing oxide in a glassy matrix (column 3, line 63 – column 4, line 37). Ellis teaches that the use of such ruthenium-based resistors provide increased reliability and stable resistance values (column 1, lines 36-44). Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Yamakawa, as modified by Manginell, ruthenium-based oxides in a glassy matrix for the purpose of increasing reliability and stability.

B. With respect to Claim 35, Yamakawa, as modified by Manginell, discloses the claimed invention, except they do not disclose a ruthenium-containing oxide resistor elements comprising Pb, Si or Bi. Ellis discloses ruthenium-containing oxide resistors comprising Pb and Si in order to achieve laser trim stability and to have the ability to shift TCR (column 3, line 63 – column 4, line 37). Therefore, at the time the invention was made, it would have been obvious to one of

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ordinary skill in the art to include in Yamakawa, as modified by Manginell, ruthenium-containing resistors comprising Pb or Si in order to provide laser trim stability and TCR shiftability.

C. With respect to Claims 37 and 38, Yamakawa, as modified by Manginell, discloses the claimed invention, except they do not disclose resistor elements having a thickness between 2 and 30 micrometers. Ellis discloses ruthenium-based *thick-film* resistors. It is notoriously well-known and within the knowledge of those of ordinary skill in the art that thick film resistors have a thickness *roughly in the range of* 25 micrometers and provide increased workability over thin-films. (See MPEP § 2144). Therefore, at the time the invention was made, it would have been obvious to one of ordinary skill in the art to include in Yamakawa, as modified by Manginell, thick-film resistors in order to provide increased workability.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Corey D. Mack whose telephone number is (703) 305-3424. The examiner can normally be reached on M-F, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Lefkowitz can be reached on (703) 305-4816. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3431 for regular communications and (703) 308-1782 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-3431.

*CDM*

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Patent Examiner  
Art Unit 2855

June 26, 2003

  
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